Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Digital Audio Broadcasting Systems	)	
And Their Impact On the Terrestrial Radio	)	MM Docket No. 99-325
Broadcast Service	)	

Comments of Kenwood USA Corporation

Kenwood USA Corporation ("Kenwood") hereby submits these Comments in response to the Commission Further Notice of Proposed Rulemaking on Digital Audio Broadcasting ("FNPRM"). The Commission sought public comment on many issues related to U.S. IBOC broadcast, including conversion policy, service rules, programming and operational rules, and technical rules.

Kenwood is one of the largest brands of car and home audio products in the world. Kenwood has been a leader in digital audio broadcasting in the United States since the launch of the first Sirius compatible satellite radio receivers in February 2001 and has to date sold more Sirius receivers than any other competitor. Kenwood launched the first commercial IBOC receiver in the U.S. with the KTC-HR100 in November 2003 and has been a leading proponent and contributor to the Tomorrow Radio effort with NPR. Kenwood has and continues to add to one of the largest databases of IBOC lab and field test data. Throughout all these efforts, Kenwood has maintained an active presence within the National Radio Systems Committee and has been involved in many industry forums on IBOC conversion, deployment and market development.

Kenwood respectfully offers the following comments in regard to the Commission's FNPRM in the matter of digital audio broadcasting.

With regard to section III.B, Conversion Policy, sections 15-17; and IV, Service Rules, section 28:

It is the commonly held belief within the industry that the conversion to an all-digital terrestrial radio system will take on the order of a decade or more. Typical consumer AM/FM products such as car stereos, clock radios and boomboxes have a lifetime on the order of seven years, depending on the category. With or without a regulatory mandate requiring conversion, we expect that there will still be a significant number of analog-only products in the field well past 2014. Therefore, the sheer magnitude of analog receivers in the field will not be forced out by a regulatory mandate in the next decade.

Consumer action to replace existing receivers is the strongest leverage to bring to bear on this situation. Commission action to make IBOC broadcasting highly desirable over analog broadcasting will help drive demand and accelerate the conversion of the analog base of receivers in the field to a digital base. History has shown that new content available only on digital receivers is the best way to stimulate this demand.

Note also that IBOC technology, in the MP1 mode, can deliver solid audio at 64Kbps, with digital services or additional channels available in the remaining 32Kbps. Use of extended hybrid frequency partitions would allow an additional 12.5-50Kbps for audio and digital services. The consumer would not be well-served by a regulatory mandate while the additional capacity of the digital system is so under-utilized.

Rather, the Commission can accelerate the entrance of receivers into the market by fostering the growth of supplemental audio channel content. This feature makes the digital receiver far superior to the analog receiver; a consumer may choose to accept lower-quality audio performance in order to hear a desired program, but if the program is only available on digital, the consumer has a real incentive to upgrade.

Therefore, we agree with the Commission in that we see no immediate need to consider mandatory transition policies of the type contemplated with respect to DTV. A review should be conducted later than the end of 2006 to review the conversion rate from analog to hybrid digital. However, the Commission should strongly act in ways that encourage supplemental channel broadcasting in order to promote diverse content which is not available on analog.

Regarding other means to advance the adoption of IBOC, we recommend the Commission encourage datacasting. This must go beyond extending the current Interim authorization to simply permit datacasting within the available 98Kbps, as that "real estate" will be quite valuable to broadcasters supporting Main and Supplemental channels in that space.

Use of additional frequency partitions, meaning the space from f_C +/- [101,744Hz to 129,361Hz], also known as Extended Hybrid in the iBiquity nomenclature, will allow for up to an additional 50Kbps broadcast data, in addition to the basic hybrid 98Kbps. Independent field trials of Extended Hybrid services will likely be conducted this summer, as an effort between Kenwood, NPR and others. These trials will result in valuable independent data regarding any consequences of Extended Hybrid operation.

For MP2 (Extended Hybrid) mode, which adds a First Primary Extended Frequency Partition (from f_C +/- [122,457Hz to 129,361Hz]), the potential for significant host (self)

interference is quite low and manageable by the transmitting station. First and second adjacent stations are unlikely to be affected by the addition of this single partition; this includes the second adjacent station's SCA transmission as the additional frequency partition would be further from the second adjacent SCA than the main IBOC carriers. The transmitting station's SCA reception should be watched, but again this is manageable by the transmitting station.

The Commission should permit use of this First Primary Extended Frequency Partition in hybrid mode so that stations may add 12.5Kbps to their service. This will have the following benefits. First, it will allow stations to work with IBOC datacasting without affecting main channel or supplemental channel data rate. Second, non-commercial broadcasters can begin supporting reading services in digital under similar conditions as for SCA-based services, with the important exception that receiver manufacturers can add the reading service feature to an IBOC receiver at almost no cost. Third, adding 12.5Kbps of datacasting capacity with a transport that is natively understood by IBOC receivers will encourage commercial broadcasters to better understand the potential challenges and rewards of datacasting. Fourth, this will provide incentive to receiver manufacturers and broadcasters to work together to enable U.S. terrestrial datacasting services, particularly with the current momentum of standardization that IBOC has under the aegis of the NRSC.

To balance these benefits against any concerns about interference, we recommend that the Commission permit the use of the First Primary Extended Frequency Partition under the following structure. First, authorization for such service should be extended to allow Extended Hybrid Mode MP2 broadcasting, which is the basic hybrid mode currently authorized with the addition of the First Primary Extended Frequency Partition. Second, such authorization should be established on a blanket basis for all digital FM stations rather than requiring broadcasters to

seek a separate datacasting authorization. Third, the Commission should address instances of unexpected levels of interference on a case-by-case basis, with the potential to reduce the Primary Extended power level relative to the Primary Main should such an interference situation arise that cannot be corrected through reorientation of receivers or other means.

Finally, the Commission should liberally permit use of the second through fourth Primary Extended Frequency Partitions (from f_C +/- [101,744 to 122,457Hz]) on an EA or STA basis, in order to permit the marketplace to develop more information about uses and consequences of these additional Partitions.

Unlike SCAs, this system uses a transport mechanism which is natively understood by IBOC receivers. This will streamline integration of new applications and services, and reduce a barrier to standardization (the requirement for special receiver hardware is greatly reduced when using IBOC as the data transport mechanism).

With regard to section IV.A, Service Rules 19:

The Commission requested comment on whether or not broadcasters should be required to provide a minimum amount of high definition audio. Our experience in similar compressed music technologies leads us to recommend against such a course. The nature of the IBOC music compression system is such that improvements in the transmitter can be adopted by the installed base of receivers without need for retrofit or replacement of those receivers. In other words, that which is acceptable quality at 64Kbps in 2004 might only require 40Kbps in 2005, given a software upgrade by the broadcaster. An IBOC receiver built in 2004 would get the same improved quality as a receiver built in 2005.

As a manufacturer of analog terrestrial radios, IBOC radios, and satellite radios, Kenwood believes the local broadcaster can best compete with national services by enhancing the listening experience with new services and new content. This is particularly true for interactive services. Both small local broadcasters and larger radio groups will innovate with new services and content, providing a rich landscape to enhance listenership in terrestrial radio.

As content diverges, audio quality must be up to the marketplace. The current direction is "content is king". Many stations and receiver manufacturers are justly proud of their audio quality, but the advent of webcasters and of satcasters has made variety of content a much more important competitive element. Broadcasters should have the flexibility to choose the service parameters to match their content, to compete and to serve the community of license.

For these reasons, we recommend that the Commission adopt an open, flexible approach to how much high definition audio must be broadcast—in fact, we believe the Commission should not set limits as the technology will soon surpass any reasonable limit set in 2004.

With regard to section IV.A, Service Rules, section 20:

The Commission seeks comment on how many audio streams a radio station should be permitted to transmit using IBOC, citing potential interference or audio quality concerns.

Regarding a single mode of operation with only the Primary Main Frequency Partitions (as authorized in the First Report and Order, October 2002), , there is no increase in interference resulting in transmitting multiple streams. That is, a broadcaster using the basic hybrid mode does not increase interference when moving from one stream (at 96Kbps) to two streams (e.g., 64+32, or 48+48) or three streams (e.g., 32+32+32).

When the bit rate is reduced from 96Kbps to 64Kbps, there is an imperceptible (for the vast majority of consumers) decrease in perceived audio quality. Below 64Kbps, there is some perceptible degradation. However, consumers have been demonstrating over the past few years with inexpensive MP3 players and tiny earphones that when there is a tradeoff necessary between the quality of the audio and the variety of the content, the marketplace chooses content.

Broadcasters may have very different kinds of content. A station with a classical music main audio program might choose only one stream. A news/talk station may want to provide three streams of speech, some possibly in mono. In a year or two, transmitter audio compression technology improvements may permit this news/talk station to add yet another stream in the same total digital audio data capacity.

The Commission should permit the marketplace to set the direction in this area. Broadcasters and their listeners should determine the appropriate number of audio streams based on their different content requirements.

One additional point to consider in this regard is that codec improvements may occur which are not fully compatible with the current IBOC receivers. This may take the form of upgrades to the HDC codec currently used, or alternative codecs. We believe HDC can be refined further to reduce bit rate requirements over time, without sacrificing backward compatibility with the growing installed base of IBOC receivers. However, there will come a point of diminishing return.

Should upgrades to HDC or alternative codecs become available to broadcasters, we recommend the Commission require that the blended audio main channel still support the original IBOC receivers. That is, while we would applaud efforts to add lower-bit-rate audio codecs, speech codecs, and other innovations, we believe it is in the best interests of the

consumers to require broadcasters to support a permanent compatibility mode on the blended main channel for current HDC receivers.

The Commission also seeks comment regarding whether supplemental streams will spur demand for IBOC radios. We strongly believe that multiple FM digital steams will motivate consumers to purchase IBOC receivers. On the other hand, AM digital audio quality is so superior to AM analog that this is a "compelling reason to buy" with or without multiple AM digital streams.

The conversion to digital does cost money, and there indeed must be compelling reasons for consumers to vote with their pocketbooks. The experience in the U.K. with Eureka 147 has shown that "content is king"; that is, the U.K. has seen success in converting to digital by making new programming available on digital channels.

Therefore, among the various benefits of IBOC technology, the elements most compelling to the consumer are the audio quality upgrade for AM and the availability of multiple channels on FM.

Our strong belief is that the FM supplemental channel capability is absolutely critical to the success of IBOC in this country. Kenwood participated with National Public Radio and Harris in the Tomorrow Radio testing, and Kenwood continues to aggressively develop and support multi-channel capability with iBiquity in IBOC. Our belief is that most receiver manufacturers will consider this capability a requirement on future IBOC receivers. The discussions we have had with some of our competitors bears this out. As an industry, the receiver makers are planning for multiple supplemental channels. That is, prior to regulatory approval on the transmit side, the industry is developing radios that can tune in two, three or

more channels on one station, courtesy of the Tomorrow Radio effort. We expect that this ability to tune to multiple supplemental channels on a single frequency will be a standard feature on receivers within a year. More specifically, Kenwood is preparing supplemental channel radios in anticipation of possible Commission action permitting supplemental channel broadcasts in hybrid and extended hybrid modes. When the Commission feels the time is right, Kenwood will be ready with products. We believe our competitors are similarly positioning themselves.

We as an industry have to assume that there will be a robust growth in supplemental channel offerings. The major public radio content providers have suggested that they will provide one or two channels of content to their members and affiliates at costs that will encourage early adoption. We believe this is sufficient to encourage the public radio listener to purchase a digital radio, particularly as costs come down.

The commercial stations have a different business model, and there is less of a clear picture on how the commercial station owners and radio groups will use supplemental channels. Several proposals are common. One idea is to put dedicated local traffic and weather on the first supplemental channel. A listener would never be more than a minute or so away from current traffic and weather. Another proposal is to simulcast in a second language. The third is to revive formats previously enjoyed in the community of license but no longer available.

Nurturing this diversity would be the best service the Commission could do for the growth of digital radio. The Commission should permit wide flexibility in content choices on supplemental channels, and adopt rules which encourage growth in supplemental channel adoption. The growth of digital radio in the U.S. will be closely tied to the growth of content available on the supplemental channels.

With regard to section IV.A, Service Rules, sections 22-24:

The Commission seeks comment on how to treat Radio Reading Services in the digital conversion and with respect to supplemental channel broadcasting.

We support Radio Reading Service digital deployment in ways that can be integrated into mass-market products for little or no additional cost. The intent of this goal is to make Reading Service products available at mass-market retailers. It is possible that the average digital radio can have Reading Services as a standard feature in a few years. The IBOC transport can accomplish this; at least it can deliver the data stream. It is too soon to tell whether the HDC codec, running on the Primary Extended Hybrid Frequency Partitions, would be suitable for such services, but it appears likely. Other approaches, such as different codecs and different modulation formats, have also been proposed.

While tests proceed over the next year, the Commission should continue to support Reading Services in ways compatible with a goal of eventual inexpensive mass-market products.

With regard to section IV.A, Service Rules, section 29:

The Commission also requested comment on subscription services, whether paid services or conditional access free services.

Regarding subscription services (or conditional access services), it is clear that commercial stations can enhance their revenue stream by adding such services; the satcasters have shown that people will pay for radio under the right circumstances. A broadcaster with alternate revenue streams may be able to reduce the commercial load on their main channel or cover the cost of other enhanced services. The current commercial model is somewhat merciless in its lack of flexibility. It permits a few major formats to survive and puts pressure on all the

rest. Permitting subscription services on supplemental channels would give commercial broadcasters some options which do not involve increasing commercial time on main channels.

That said, the main channel should remain subscription-free (open access), as part of the public interest obligation of the broadcaster. However, the prospect of non-commercial stations offering subscription content on supplemental channels is an intriguing enhancement to the public radio sector, and we support permitting non-commercial stations to have subscription services on supplemental channels provided the main channel remains open access.

One caveat is that conditional access hardware is priced according to the level of security afforded. Simple conditional access arrangements which involve entering a button code on the receiver panel, or giving receivers unique addresses, are inexpensive but easily hacked by unscrupulous individuals. Stronger conditional access hardware—at the level of the satcasters' conditional access systems—is extremely difficult to hack but also quite expensive (satcasters subsidize the cost of satellite receivers, this is why the consumer does not see this expense).

It is important to remember that some applications require only minimal, inexpensive security. Others require stronger, more expensive measures. The Commission should permit applications to choose the appropriate level of security for their application. With this in mind, however, we believe Radio Reading Services would be appropriately served with a minimal approach, such as requiring the user to enter an access code on the front panel, or arrangements which involve broadcasting an address for the receiver.

With regard to section IV.B, Programming and Operational Rules, section 55:

The Commission additionally seeks comment regarding alternate means of signal delivery to booster stations. With IBOC, we agree that direct, over-the-air reception of the

primary FM station digital signal is not a good solution. Optimum performance can be achieved by careful timing alignment between the primary and booster digital signals. In fact, timing alignment adjustments between different transmitters is an important tool for broadcasters using OFDM-based technologies; note that there is no over-the-air requirement for the terrestrial booster stations of the satcasters.

If the booster signal is intended to overlap the main signal, and carries the same content as the main signal, its transmitter must be fed an identical copy of the modulated signal used to create the main signal. Note that these signals should not be required to be broadcast in perfect synchronization as some intentional misalignment in time can be useful in planning the terrestrial coverage.

One implication of this is that the broadcaster can not have any difference in the audio or digital content between the main and the booster. Any requirement to identify the booster with different call letters should be closely reexamined in the face of this technical issue.

To summarize, there should be no regulatory mandate for conversion; rather we believe content opportunities will drive conversion, promote diversity and stimulate localism. To enable this, the Commission should encourage supplemental channel broadcasting by authorizing broadcasters to individually select the appropriate number of supplemental channels and the digital audio bandwidth allocated to each. Extended hybrid should also be encouraged, as should datacasting. Subscription services should be an option on any but the main channel, which should remain both free and compatible with the first HDC receivers. Regulations regarding

Reading services should be tuned to allow manufacturers to eventually offer such features as standard on mass-market products.

Kenwood salutes the Commission for its efficient assessment and action on terrestrial digital audio broadcasting to date. We look forward to more variety in content and services for U.S. consumers as the AM/FM dial continues to progress in the digital conversion, and we will be ready with products to support supplemental channel and datacasting when the Commission authorizes these promising new developments.

Respectfully submitted,

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